

## CLAIMS

What is claimed is:

1. A computer operable method for identifying mis-routing of calls in a telephone system, comprising the steps of:
  - 4 selecting a first and second call records, providing the call records comprise call characteristic information created at separate locations in the telephone system and providing the call records identify same called station;
  - 8 establishing whether first and second call records are correlated; and
  - 10 when first and second call records are correlated,
    - 12 establishing a measure of the probability of call mis-routing.
2. A computer operable method as recited in claim 1, wherein the method step for establishing whether the first and second call records are correlated comprises:
  - 4 subtracting a first timestamp included with the first call record from first timestamp included with the second call record, wherein first timestamp is time of a call initiation signal;
  - 8 when the absolute value of the result of first timestamp subtraction method step is greater than a first preselected value,
  - 10 identifying first and second call records as uncorrelated;

14                   otherwise,

16                   identifying first and second call records as correlated; and

18                   when first and second call records are identified as correlated and a  
20                   second timestamp included with first and second call records is used to  
22                   establish correlation of first and second call records,

24                   subtracting the second timestamp of the first call record from the  
26                   second timestamp of the second call record, wherein second  
28                   timestamp is the time of a first party disconnect signal; and

30                   when the absolute value of the result of second timestamp  
32                   subtraction method step is greater than a second preselected  
34                   value,

36                   identifying first and second call records as uncorrelated.

38                   3. A computer operable method as recited in claim 2, wherein the method  
40                   step for establishing whether the first and second call records are  
42                   correlated further comprises:

44                   when first and second call records are identified as correlated and a third  
46                   timestamp included with first and second call records is used to establish  
48                   correlation of first and second call records,

50                   subtracting the third timestamp of the first call record from the  
52                   third timestamp of the second call record, wherein third  
54                   timestamp is the time of a call connect signal; and

56                   when the absolute value of the result of third timestamp

14 subtraction method step is greater than a third preselected value,

16 identifying first and second call records as uncorrelated;

18 when first and second call records are identified as correlated, the identity  
20 of a calling station included in first and second call records is used to  
establish correlation of first and second call records, and when the call  
records identify different calling stations,

22 identifying first and second call records as uncorrelated;

24 when first and second call records are identified as correlated, the charge  
26 number of the calling station included in first and second call records is  
used to establish correlation of first and second call records, and when the call  
28 records identify different charge numbers,

30 identifying first and second call records as uncorrelated; and

32 when first and second call records are identified as correlated, the  
jurisdiction of the call included in first and second call records is used to  
34 establish correlation of first and second call records, and when the call  
records identify different jurisdictions,

36 identifying first and second call records as uncorrelated.

4. A computer operable method as recited in claim 1, wherein the method  
2 step for establishing the measure of the probability of call mis-routing  
comprises:

4 when a forward interworking parameter bit is used to establish a measure  
6 of the probability of call mis-routing,

8 identifying the percentage of calls wherein forward interworking  
parameter bit is set;

10 when a backward interworking parameter bit is used to establish a  
measure of the probability of call mis-routing,

12 identifying the percentage of calls wherein backward  
14 interworking parameter bit is set;

16 when percentage of calls wherein identity of the calling station is  
included in the call records is used to establish a measure of the  
18 probability of call mis-routing,

20 identifying the percentage of calls wherein the identity of the  
calling station is included in the call records;

22 when percentage of calls terminating in an independent local exchange  
carrier is used to establish a measure of the probability of call mis-  
24 routing,

26 identifying the percentage of calls terminating in an independent  
28 local exchange carrier;

30 when percentage of calls wherein jurisdiction indicator parameter is  
available is used to establish a measure of the probability of call mis-  
32 routing,

34 identifying the percentage of calls wherein the jurisdiction  
indicator parameter is available;

36 when percentage of calls wherein carrier identification parameter is

38                   available is used to establish a measure of the probability of call mis-routing,

40                   identifying the percentage of calls wherein the carrier identification parameter is available; and

44                   when percentage of calls wherein the number of area codes associated with the calling station is used to establish a measure of the probability of call mis-routing,

48                   identifying the number of area codes associated with the calling station; and

50                   combining results of above method steps.

5.                  A computer operable method as recited in claim 1, wherein the method step for establishing the measure of the probability of call mis-routing comprises:

4                   creating a historical traffic profile of first and second connecting carriers, wherein the connecting carriers connect to the local exchange carrier;

8                   computing the degree to which traffic profiles of first and second connecting carriers change inversely to each other; and

10                  using the results of the computation method step to establish the measure of the probably of call mis-routing.

6. A computer program storage medium readable by a computer, tangibly embodying a computer program of instructions executable by the computer to perform method steps for identifying mis-routing of calls in a telephone system, the steps comprising:

10 selecting a first and second call records, providing the call records comprise call characteristic information created at separate locations in the telephone system and providing the call records identify same called station;

12 establishing whether first and second call records are correlated; and

14 when first and second call records are correlated,

16 establishing a measure of the probability of call mis-routing.

7. A computer program storage medium as recited in claim 6, the step for establishing whether the first and second call records are correlated comprising:

10 subtracting a first timestamp included with the first call record from first timestamp included with the second call record, wherein first timestamp is time of a call initiation signal;

12 when the absolute value of the result of first timestamp subtraction method step is greater than a first preselected value,

14 identifying first and second call records as uncorrelated;

otherwise,

16 identifying first and second call records as correlated; and  
17

18 when first and second call records are identified as correlated and a  
19 second timestamp included with first and second call records is used to  
20 establish correlation of first and second call records,

21 subtracting the second timestamp of the first call record from the  
22 second timestamp of the second call record, wherein second  
23 timestamp is the time of a first party disconnect signal; and  
24

25 when the absolute value of the result of second timestamp  
26 subtraction method step is greater than a second preselected  
27 value,

28 identifying first and second call records as uncorrelated.

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30 8. A computer program storage medium as recited in claim 7, the step for  
31 establishing whether the first and second call records are correlated  
32 further comprising:

33 when first and second call records are identified as correlated and a third  
34 timestamp included with first and second call records is used to establish  
35 correlation of first and second call records,

36 subtracting the third timestamp of the first call record from the  
37 third timestamp of the second call record, wherein third  
38 timestamp is the time of a call connect signal; and  
39

40 when the absolute value of the result of third timestamp  
41 subtraction method step is greater than a third preselected value,

16 identifying first and second call records as uncorrelated;

18 when first and second call records are identified as correlated, the identity  
20 of a calling station included in first and second call records is used to  
22 establish correlation of first and second call records, and when the call  
records identify different calling stations,

24 identifying first and second call records as uncorrelated;

26 when first and second call records are identified as correlated, the charge  
28 number of the calling station included in first and second call records is  
used to establish correlation of first and second call records, and when the call  
records identify different charge numbers,

30 identifying first and second call records as uncorrelated; and

32 when first and second call records are identified as correlated, the  
34 jurisdiction of the call included in first and second call records is used to  
36 establish correlation of first and second call records, and when the call  
records identify different jurisdictions,

38 identifying first and second call records as uncorrelated.

2 9. A computer program storage medium as recited in claim 6, the step for  
comprising:  
4 establishing the measure of the probability of call mis-routing

6 when a forward interworking parameter bit is used to establish a measure  
of the probability of call mis-routing,

8 identifying the percentage of calls wherein forward interworking

parameter bit is set;

10

when a backward interworking parameter bit is used to establish a  
12 measure of the probability of call mis-routing,

14

identifying the percentage of calls wherein backward  
interworking parameter bit is set;

16

when percentage of calls wherein identity of the calling station is  
18 included in the call records is used to establish a measure of the  
probability of call mis-routing,

20

identifying the percentage of calls wherein the identity of the  
22 calling station is included in the call records;

24

when percentage of calls terminating in an independent local exchange  
carrier is used to establish a measure of the probability of call mis-  
26 routing,

28

identifying the percentage of calls terminating in an independent  
local exchange carrier;

30

when percentage of calls wherein jurisdiction indicator parameter is  
32 available is used to establish a measure of the probability of call mis-  
routing,

34

identifying the percentage of calls wherein the jurisdiction  
36 indicator parameter is available;

38

when percentage of calls wherein carrier identification parameter is  
available is used to establish a measure of the probability of call mis-

40 routing,

42 identifying the percentage of calls wherein the carrier  
identification parameter is available; and

44 when percentage of calls wherein the number of area codes associated  
46 with the calling station is used to establish a measure of the probability  
of call mis-routing,

48 identifying the number of area codes associated with the calling  
50 station; and

52 combining results of above method steps.

10. A computer program storage medium as recited in claim 6, the step for  
2 establishing the measure of the probability of call mis-routing  
comprising:

4 creating a historical traffic profile of first and second connecting carriers,  
6 wherein the connecting carriers connect to the local exchange carrier;

8 computing the degree to which traffic profiles of first and second  
connecting carriers change inversely to each other; and

10 using the results of the computation method step to establish the measure  
of the probably of call mis-routing.